

# SHIFT

## Shared History Instruction Fetch for Lean-Core Server Processors

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Session 4A, Tuesday @ 11:30am



Core



**Instruction fetch stalls:**  
Major performance bottleneck  
Up to 60% of server exec. time



Core

Temporal Stream



I-History



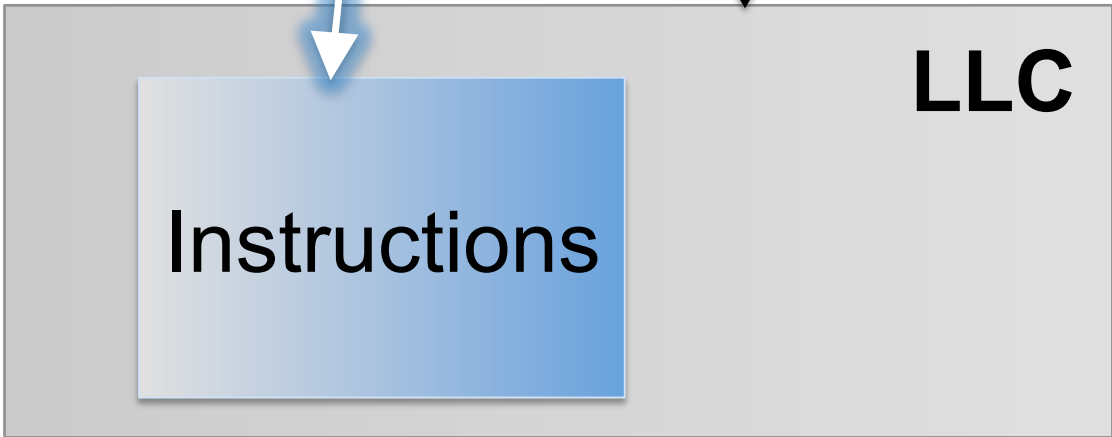


Core



I-History

Prefetch





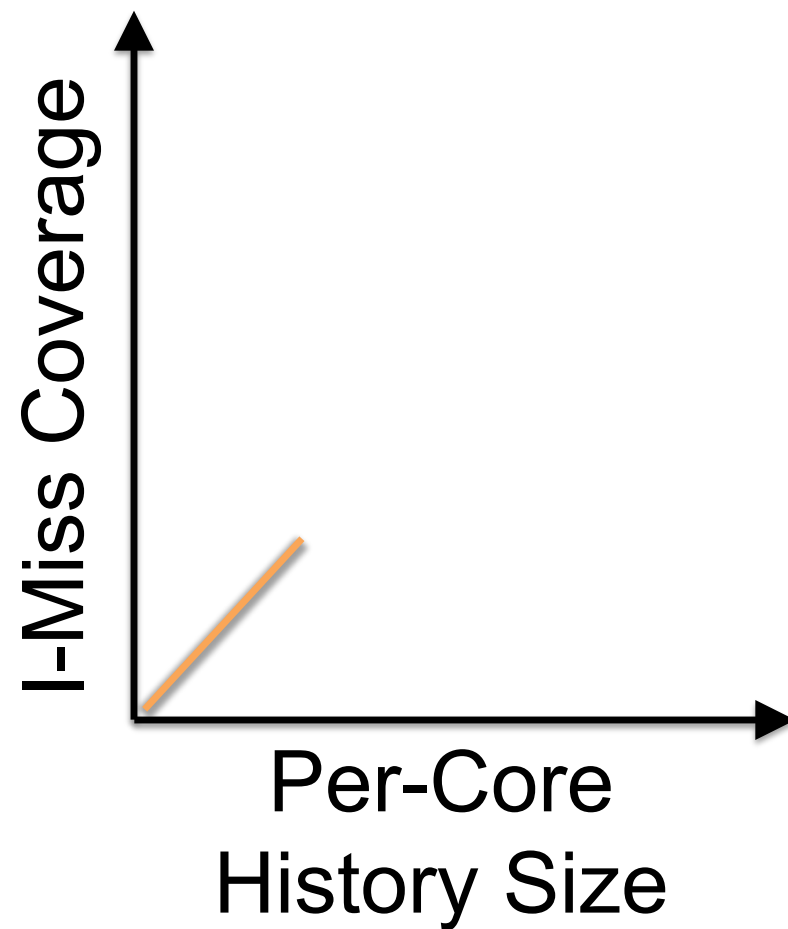
Core

I-History

I-\$

LLC

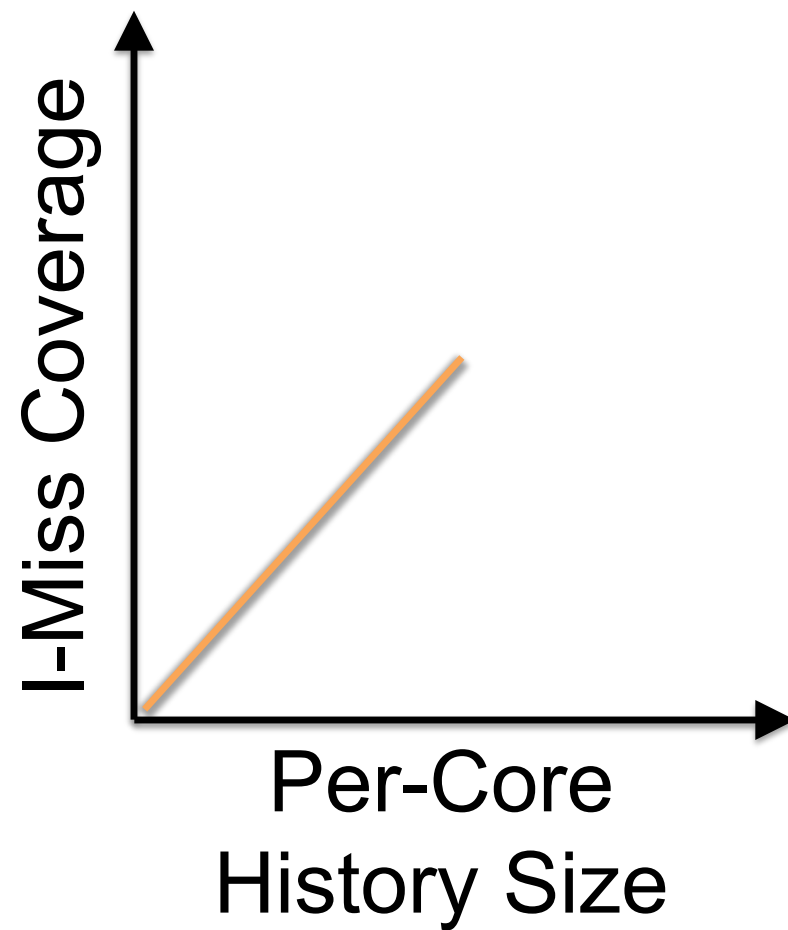
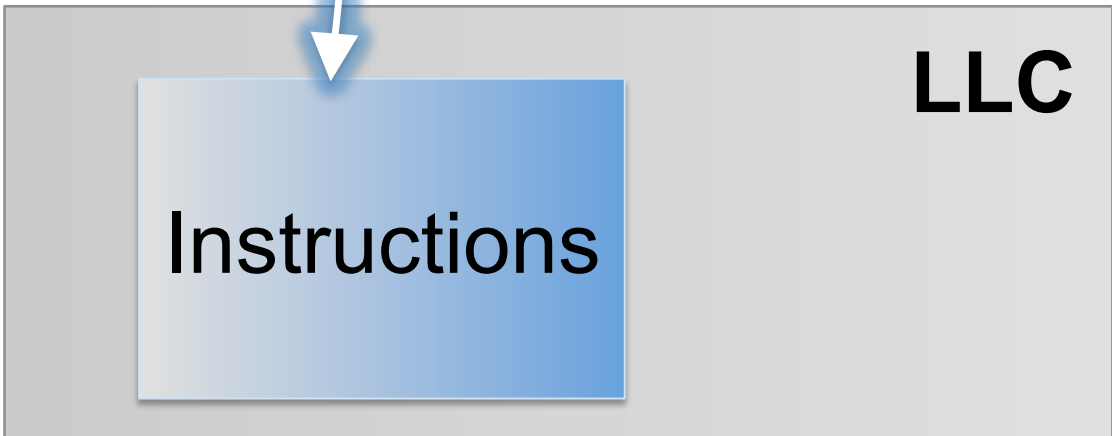
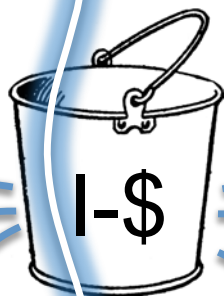
Instructions

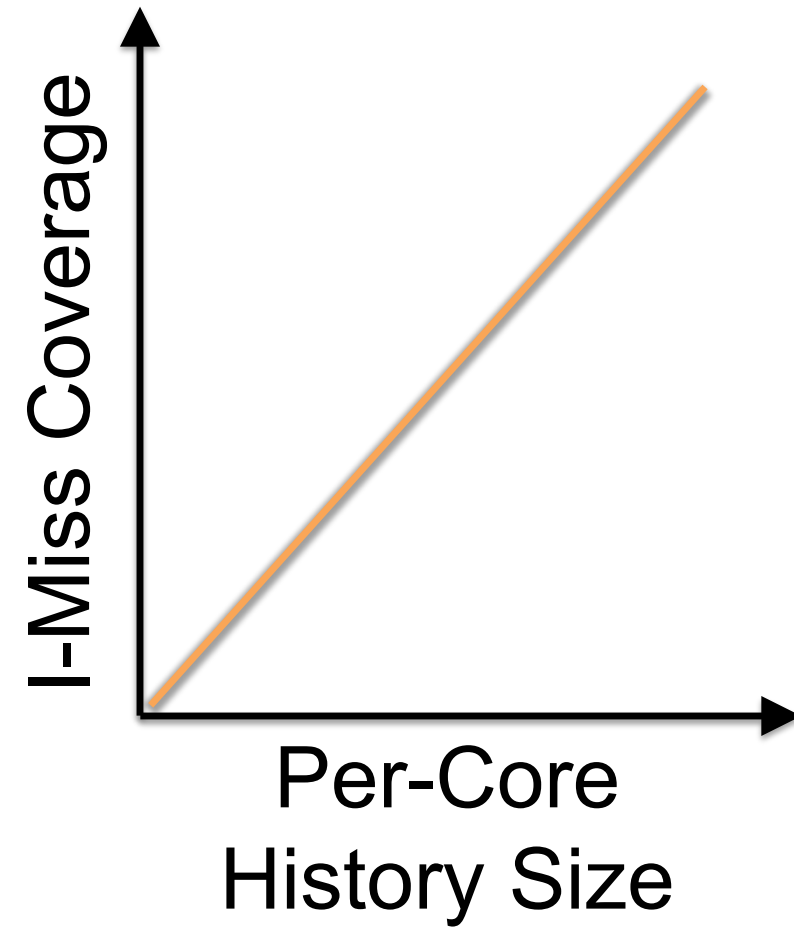
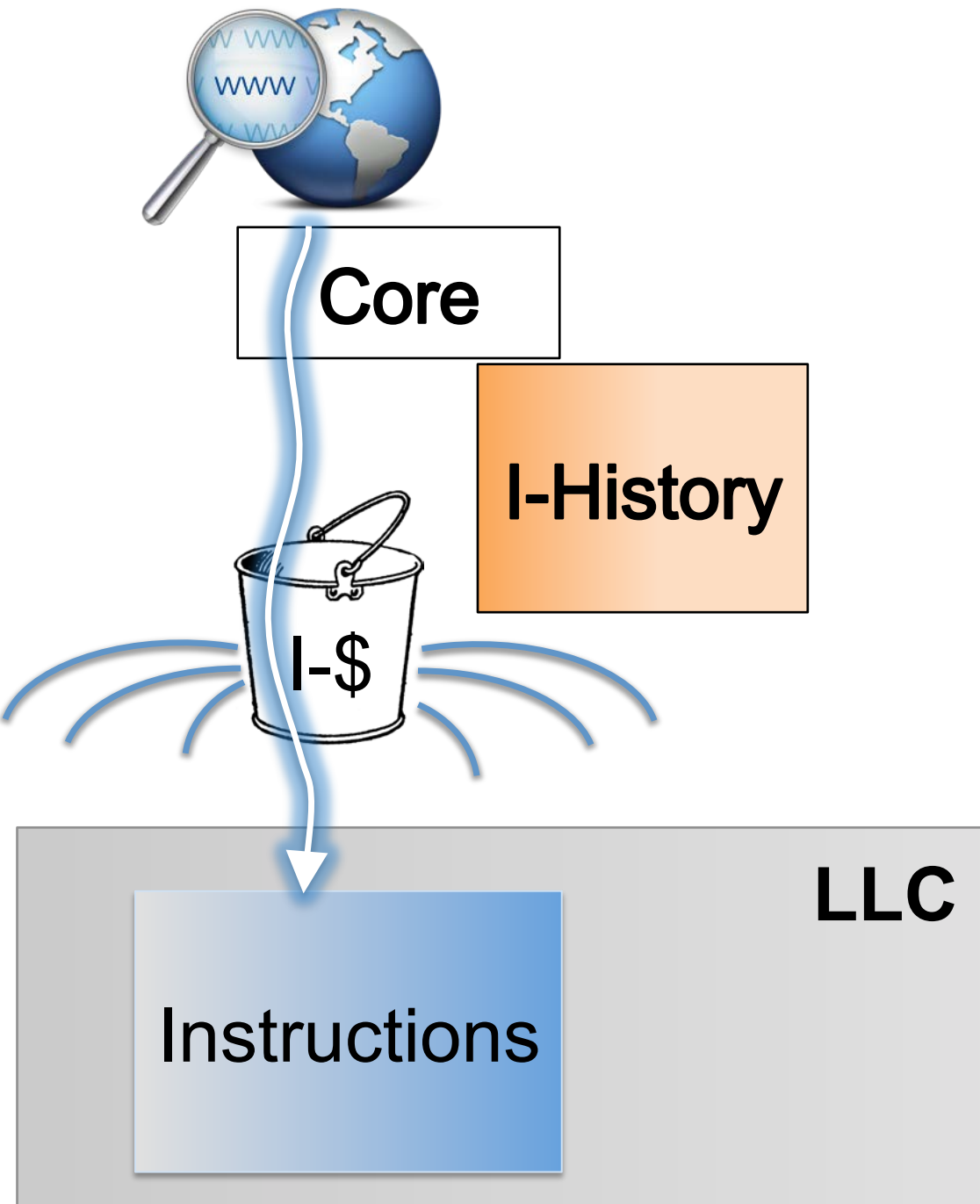


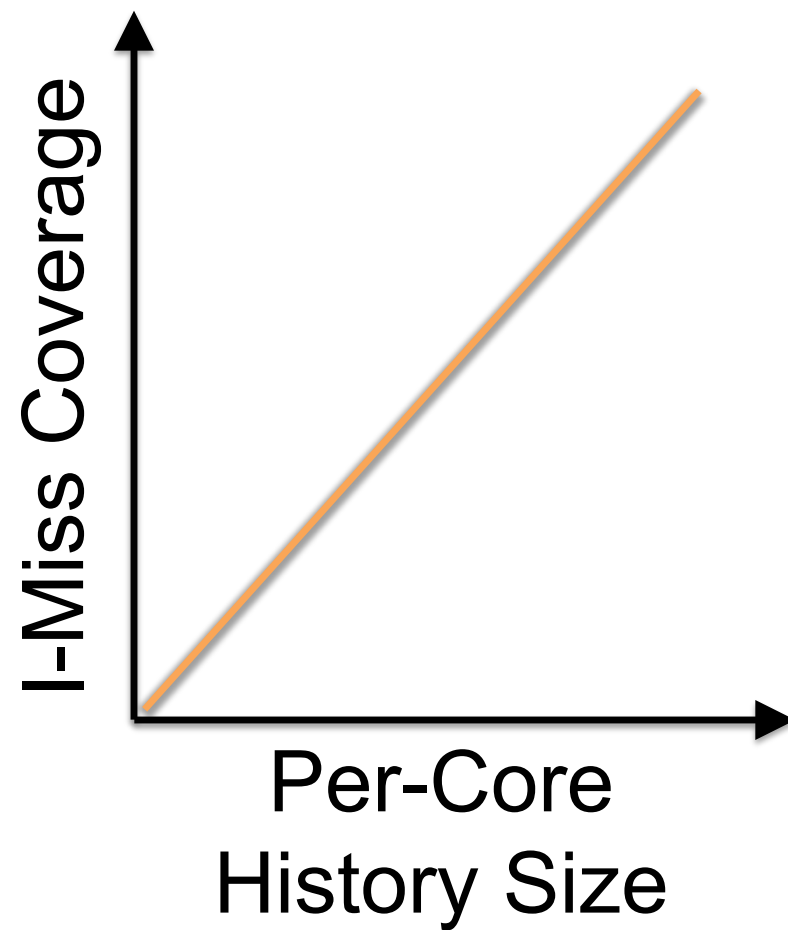
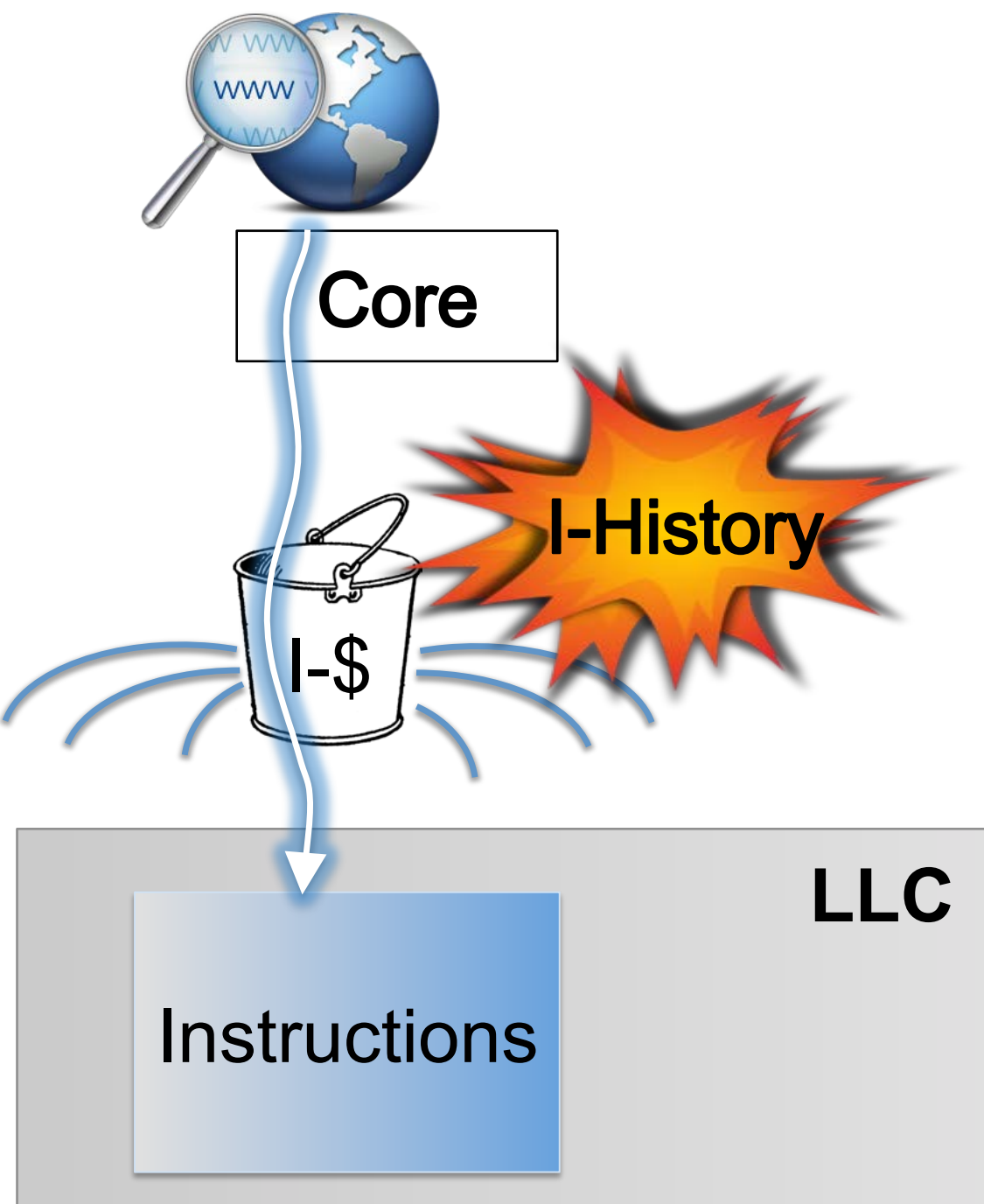


Core

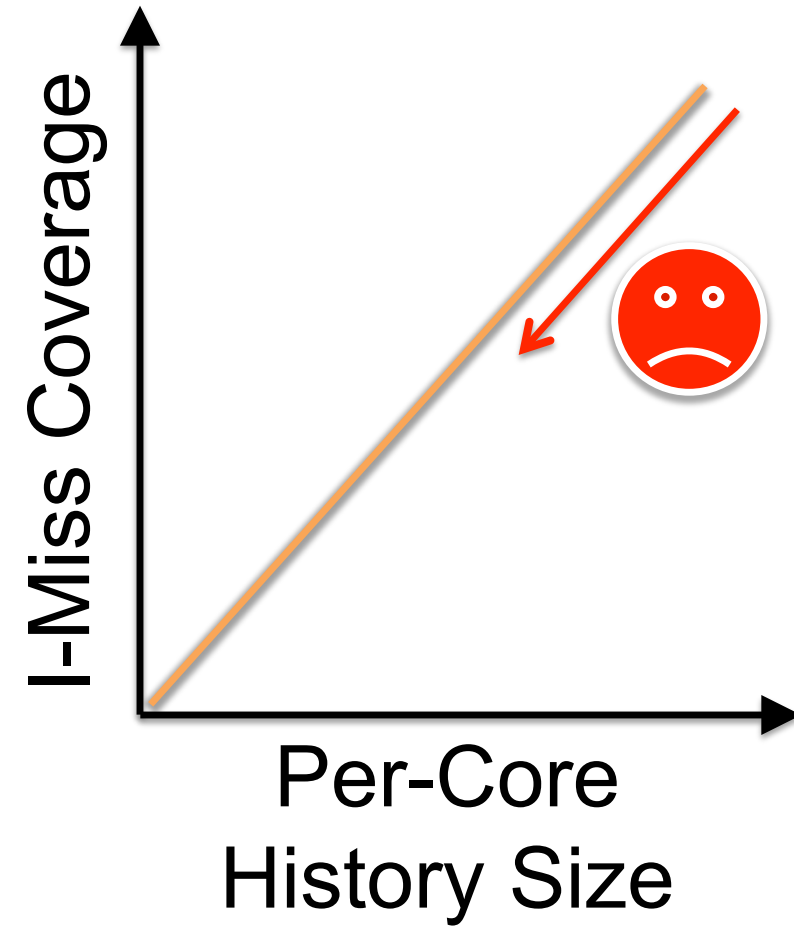
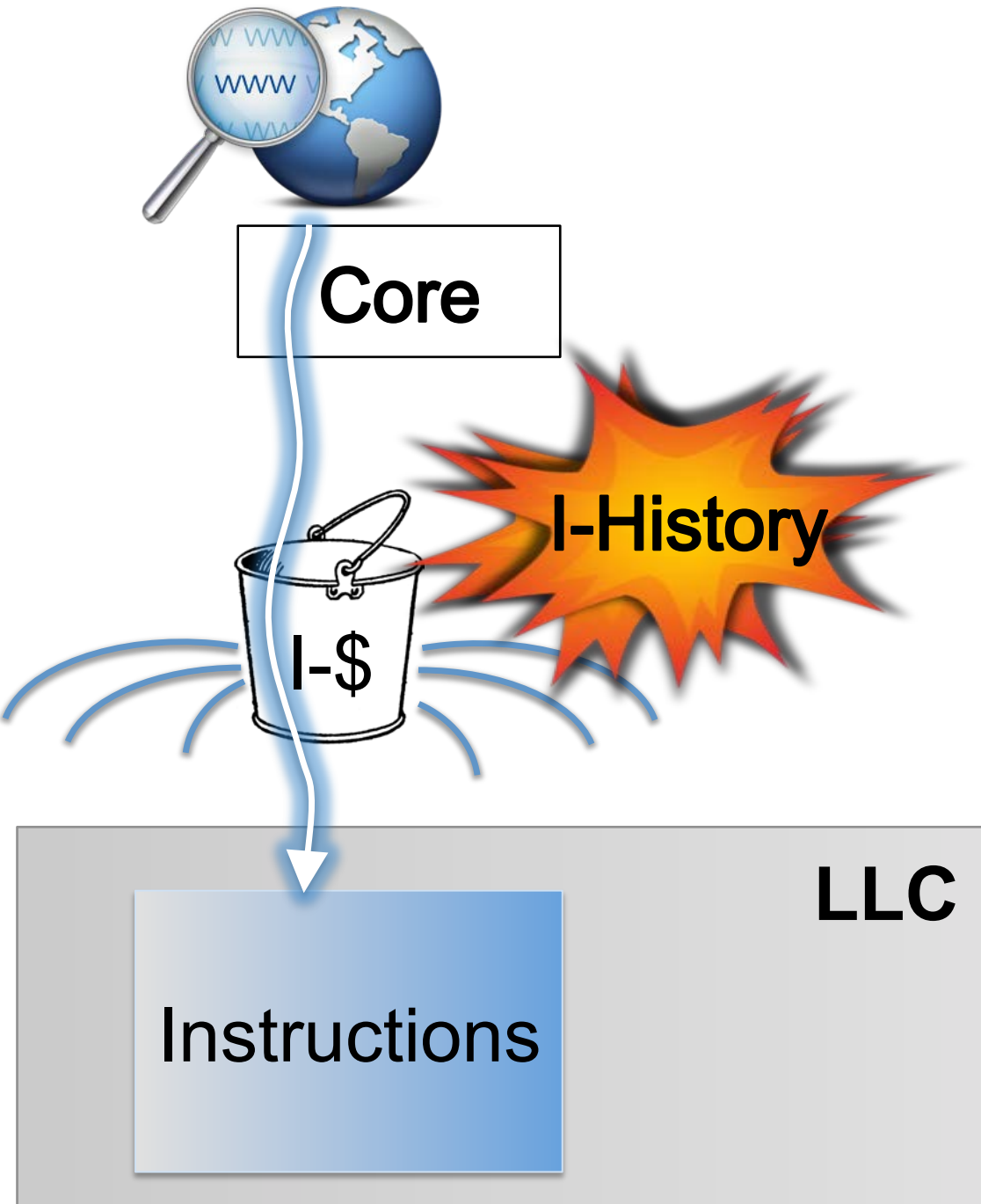
I-History





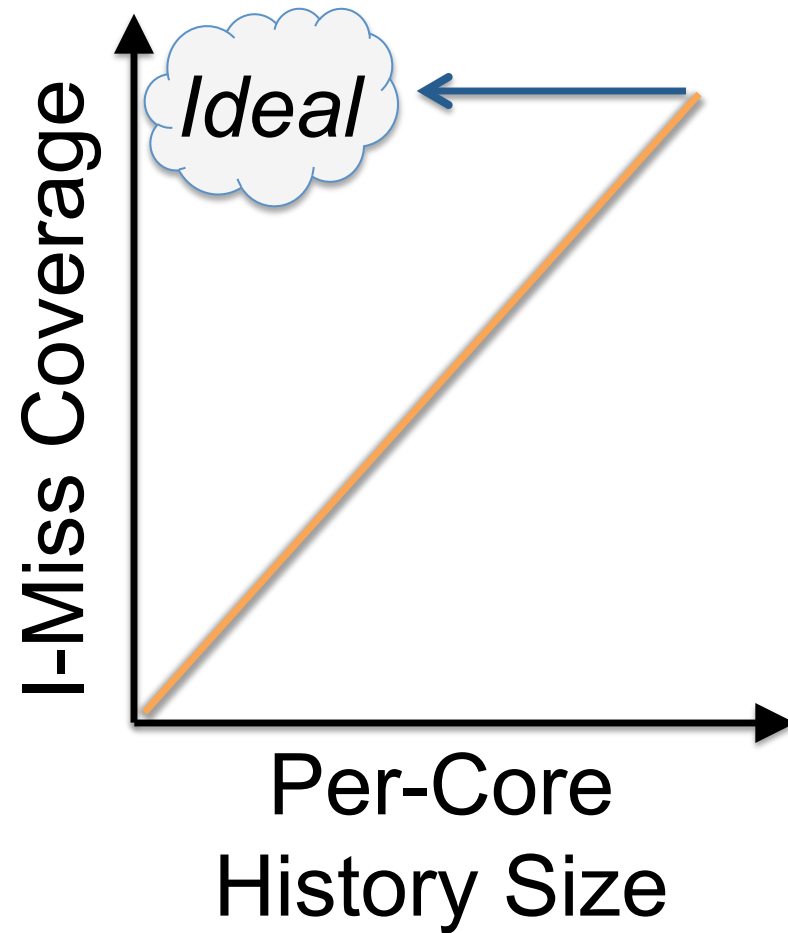
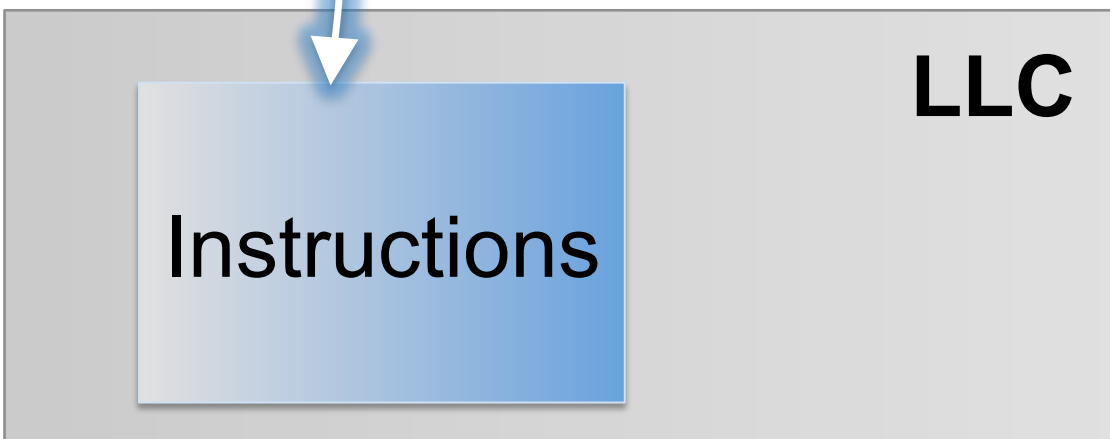
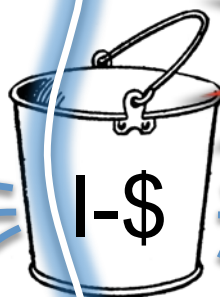




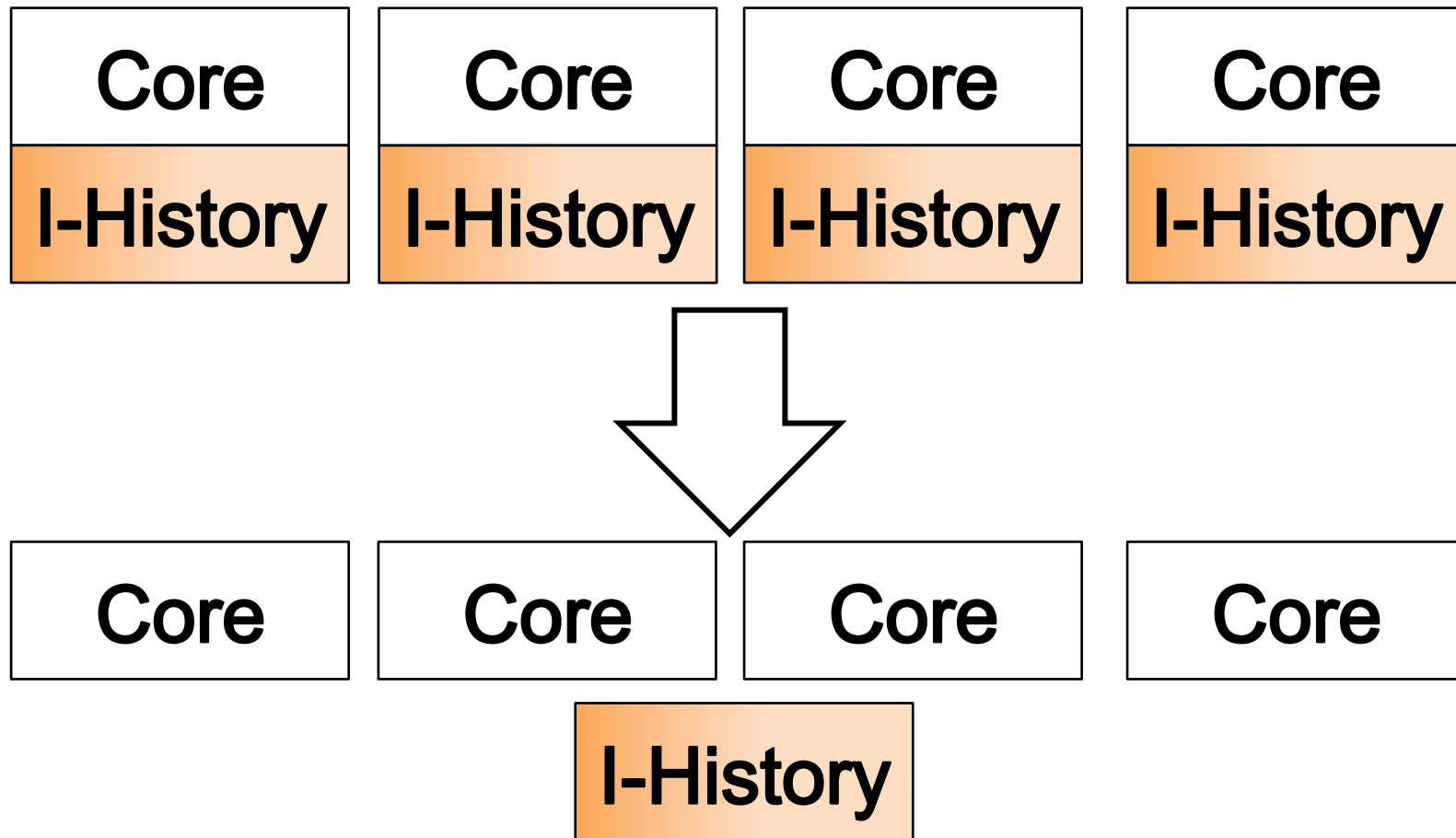




Core



# Shared History Instruction Fetch



- ✓ Preserves performance of per-core history
- ✓ At 1/14<sup>th</sup> of history size